

SAN DIEGO HORNED LIZARD

Phrynosoma coronatum blainvillii

Authors: Bradford D. Hollingsworth¹ and Kent R. Beaman², ¹Department of Herpetology, San Diego Natural History Museum, P.O. Box 121390, San Diego, CA 92112, and ²Section of Herpetology, Natural History Museum of Los Angeles County, 900 Exposition Blvd., Los Angeles, CA 90007

Management Status: Federal: USFWS Species of Concern
California: Species of Special Concern (CDFG, 1998)

General Distribution:

The San Diego Horned Lizard (*Phrynosoma coronatum blainvillii*) is endemic to southern California and northern Baja California, México. In California, this species is distributed predominately throughout cismontane regions of the Transverse Ranges in Kern, Los Angeles, Santa Barbara, San Bernardino, and Ventura Counties, southward to the Peninsular Ranges in Orange, Riverside, and San Diego Counties (Van Denburgh, 1922; Smith, 1946; Reeve, 1952; Schmidt, 1953; Pickwell, 1972; Jennings, 1988; Jennings and Hayes, 1994; Brattstrom, 1997).

Distribution in the West Mojave Planning Area:

This species is distributed along the southern margin of the WMPA. Within the WMPA, the San Diego Horned Lizard (SDHL) occurs from the Antelope Valley California Poppy State Reserve eastward along the base of the San Gabriel and San Bernardino Mountains to Joshua Tree National Park (Jennings and Hayes, 1994; Brattstrom, 1997). The northernmost distribution records within the WMPA occur in the Antelope Valley California Poppy State Reserve (Brattstrom, pers. comm.). The population along the Mojave River, near Oro Grande, is believed to be extinct (Jennings and Hayes, 1994).

Natural History:

The SDHL is a medium-sized lizard (SVL 4.3 in [110 mm]) with a dorsoventrally compressed body and short tail. The posterior margin of head has enlarged head scales, orientated posteriorly, forming a crown of dagger-like spines; the two posteriormost spines are larger than those more lateral. The supraocular scale is pointed and orientated posteriorly, the dorsal body and legs are interspersed with enlarged, keeled to pointed scales, and the lateral body and tail have enlarged, pointed fringes. The dorsal ground color is yellowish, light brown, gray, white, or reddish-brown with dark blotches on the neck and back, usually matching the substrate color, while the ventral color is light yellow to white with dusky spots (Van Denburgh, 1922; Smith, 1946; Reeve, 1952; Stebbins, 1972, 1985).

The SDHL is distinguished from all other species of horned lizard by the presence of two rows of lateral body fringe scales, two to three rows of enlarged, pointed scales on

the sides of the throat, and smooth, convex dorsal head scales (Smith, 1946; Reeve, 1952; Stebbins, 1985; Brattstrom, 1997). Recent taxonomic studies of *Phrynosoma coronatum* (Grismer and Mellink, 1994; Brattstrom, 1997) indicate that there is no character basis for the recognition of the various subspecies.

The SDHL is usually a solitary animal that relies on camouflage in open areas and is known to bury itself in fine, loose soil (Stebbins, 1985; Jennings and Hayes, 1994). Defensive behavior includes lowering the head to expose the head spines (Smith, 1946; Reeve, 1952), puffing up the body (Tollestrup, 1981; Jennings and Hayes, 1994), and squirting of blood from the eye due to the rupturing of a sinus vessel inside the eyelid (Bryant, 1911; Klauber, 1939; Burleson, 1942; Smith, 1946; Reeve, 1952; Stebbins, 1985).

The SDHL is insectivorous, feeding primarily on native harvester ants (*Pogonymyrmex* sp.), but it will also feed on termites, beetles, flies, wasps, and grasshoppers (Ingles, 1929; Reeve, 1952; Miller and Stebbins, 1964; Dixon, 1967; Pianka and Parker, 1975; Stebbins, 1985; Jennings and Hayes, 1994).

Sexual maturity is reached at a size of 3 in (73-76 mm) SVL, two to three years after hatching (Howard, 1974; Pianka and Parker, 1975; Goldberg, 1983; Stebbins, 1985; Jennings and Hayes, 1994). A clutch of 6-17 eggs are laid between May and early July (Howard, 1974; Goldberg, 1983; Stebbins, 1985; Jennings and Hayes, 1994). Eggs hatch in approximately two months appearing in July and early August (Shaw, 1952; Howard, 1974; Goldberg, 1983; Jennings and Hayes, 1994).

Seasonal activity occurs between late March and early October, with hibernation setting in as early as August (Pequegnat, 1951; Howard, 1974; Jennings, 1987; Hager, 1992). Daily activity patterns are temperature dependent and lizards will emerge from their burial sites before sunrise to position themselves for basking in the first rays of sun (Heath, 1965; Hager, 1992; Jennings and Hayes, 1994). The SDHL has a internal body thermal voluntary maximum of 102.2 F (39.0 C), thermal voluntary minimum of 69.4 F (20.8 C), and thermal preference of 94.8 F (34.9 C; Brattstrom, 1965; Heath, 1965; Jennings and Hayes, 1994).

Predators of the SDHL include coyotes (*Canis latrans*), badgers (*Taxidea taxus*), foxes, kestrels, falcons, shrikes, roadrunners (*Geococcyx californianus*), burrowing owls, and various snakes including the southern pacific rattlesnake (*Crotalus viridis helleri*) and Striped Racer (*Masticophis lateralis*; Bryant, 1916; Von Bloeker, 1942; Klauber, 1972; Eakle, 1984).

Habitat Requirements:

San Diego Horned Lizards are found in a wide variety of habitats including coastal sage scrub, chaparral, grassland, coniferous forest, oak woodland, riparian, and the margins of the higher elevation desert where it is restricted to the juniper-desert chaparral (Grinnell and Grinnell, 1907; Van Denburgh, 1922; Klauber, 1939; Smith, 1946; Dixon, 1967; Stebbins, 1985; Jennings and Hayes, 1994; Brattstrom, 1997). Within each of these habitats, this species prefers areas with loose, fine soils, an abundance of open areas for basking, and plenty of native ants and other insects (Jennings and Hayes, 1994). This species has been reported from elevations ranging from sea level to 8,000 ft (0-2600 m; Brattstrom, 1997).

Population Status:

No reliable data on population status and relative density of the SDHL are available. Hager (1992) presented information on home range and movement in San Bernardino and Riverside Counties, but due to difficulties in re-sightings, home ranges are likely underestimated and interpretations of movement patterns inconclusive (Jennings and Hayes, 1994). The SDHL is believed to be extinct in 45% of its original range in southern California, including desert regions near Palmdale, Los Angeles County and the Mojave River, San Bernardino County (Jennings and Hayes, 1994).

Threats Analysis:

A number of factors have been implicated in the decline of the SDHL, including collecting, habitat loss, off-highway vehicles (OHV), livestock grazing, and the introduction of Argentine ants (Jennings and Hayes, 1994). Unfortunately, there is little baseline data to properly understand the exact nature of the current decline.

The SDHL was heavily exploited at the turn of the century for the curio trade (Jennings, 1987); horned lizards were varnished or sold as pets (Klauber, 1939). Later, biological supply companies and the modern pet trade contributed to their exploitation, until 1981, when commercial collecting was banned (Jennings and Hayes, 1994).

The SDHL's habitat is increasingly becoming destroyed and fragmented due to urban development, the conversion of land to agriculture, and OHV use (Jennings and Hayes, 1994). Habitat loss and collecting have been cited as the main reasons for this species decline (Jennings, 1987). Additional disturbances may include the construction of fire breaks and the use of prescribed burning.

Other pressures include the loss of the native ant food base due to their progressive elimination by Argentine ants (*Iridomyrmex humilis*; Ward, 1987; Jennings and Hayes, 1994) and increased predation by domestic dogs and cats (Hayes and Guyer, 1981; Jennings and Hayes, 1994).

Biological Standards:

Management efforts should be directed at identifying the best remaining habitat and largest populations to determine areas that should be protected from human disturbance (Jennings and Hayes, 1994). Until then, some level of protection can be achieved through land use restrictions. Extensive studies are needed to develop baseline data about existing populations. The impact of OHV activity, predation by domestic pets, and the replacement of native ants by introduced Argentine ants need to be more precisely understood, as well as the effects of livestock grazing and prescribed burning (Jennings and Hayes, 1994). A well-supervised, repetitive pitfall trap program could provide baseline data that would aid in our understanding of the distribution and population status of the SDHL. In addition, genetic studies focusing on interpopulational relationships could greatly increase our understanding about population associations and their relative distinctiveness from each other. These studies may prove particularly useful if mitigation of existing populations is needed. A management plan or recommendation for long-term population viability is inconclusive until additional population data become available.

Literature Cited:

- Brattstrom, B.H. 1965. Body temperature in reptiles. *Amer. Midl. Nat.* 73(2):376-422.
- _____. 1997. Status of the subspecies of the coast horned lizard, *Phrynosoma coronatum*. *J. Herpetol.* 31(3):434-437.
- Bryant, H.C. 1911. The horned lizards of California and Nevada of the genera *Phrynosoma* and *Anota*. *Univ. California Publ. Zool.* 9(1):1-84.
- _____. 1916. Habits and food of the roadrunner in California. *Univ. California Publ. Zool.* 17(5):21-58.
- Burleson, G.L. 1942. The source of blood ejected from the eye by horned toads. *Copeia* 1942(4):246-248.
- Dixon, J.R. 1967. Amphibians and reptiles of Los Angeles County. *Los Angeles County Mus. Nat. Hist. Science Ser.* 23(10):1-63.
- Eakle, W.L. 1984. Observations of nesting falcons in the Los Padres National Forest. *Raptor Res.* 18(1):31-33.
- Grinnell, J. and H.W. Grinnell. 1907. Reptiles in Los Angeles County, California. *Throop Institute Bull.* 35:1-64.
- Grismer, L.L. and E. Mellink. 1994. An addition of *Sceloporus occidentalis* to the herpetofauna of Isla de Cedros, Baja California, México and its historical and taxonomic implications. *J. Herpetol.* 28:120-126.
- Goldberg, S.R. 1983. Reproduction of the coast horned lizard, *Phrynosoma coronatum*, in southern California. *Southwest. Nat.* 28(4):478-479.
- Hager, S.B. 1992. Surface activity, movement, and home range of the San Diego horned lizard, *Phrynosoma coronatum blainvillii*. M.S. Thesis, California State Univ., Fullerton, California.
- Hayes, M.P. and C. Guyer. 1981. The herpetofauna of Ballona. pp. H-1 to H-80. *In:* R. S. Schreiber (ed.), *The biota of the Ballona region, Los Angeles County. Supplement I, Marina Del Rey/Ballona Local Coastal Plan, Los Angeles County Natural History Museum Foundation, Los Angeles, California.*
- Heath, J.E. 1965. Temperature regulation and diurnal activity in horned lizards. *Univ. California Publ. Zool.* 64(3):97-136.
- Howard, C.W. 1974. Comparative reproductive ecology of horned lizards (genus *Phrynosoma*) in southwestern United States and northern Mexico. *J. Arizona Acad. Sci.* 9(3):108-116.
- Ingles, L.G. 1929. The seasonal and associated distribution of the fauna of the upper Santa Ana River Wash. *J. of Entomol. and Zool. (Pomona College)* 21(1,2):1-96.
- Jennings, M.R. 1987. Impact of the curio trade for San Diego Horned Lizards (*Phrynosoma coronatum blainvillii*) in the Los Angeles Basin, California: 1885-1930. *J. Herpetol.* 21(4):356-358.
- _____. 1988. *Phrynosoma coronatum*.. *Cat. Amer. Amph. Rept.* 428.1-5.
- _____. and M.P. Hayes. 1994. Amphibian and reptile species of special concern in California. Final Report, Contract 8023. California Department of Fish and Game, Inland Fisheries Division, Sacramento, California.
- Klauber, L.M. 1939. Studies of reptile life in the arid southwest. *Bull. Zool. Soc. San Diego* 14:1-100.

- _____. 1972. Rattlesnakes: their habits, life histories and influence on mankind. 2nd ed. Univ. California Press, Berkeley, California.
- Miller, A.H. and R.C. Stebbins. 1964. The lives of desert animals in Joshua Tree National Monument. Univ. California Press, Berkeley, California.
- Pequegnat, W.E. 1951. The biota of the Santa Ana Mountains. J. Entomol. and Zool. (Pomona College) 42(3,4):1-84.
- Pianka, E.R. and W.S. Parker. 1975. Ecology of horned lizards: a review with special references to *Phrynosoma platyrhinos*. Copeia 1975(1):141-162.
- Pickwell, G.V. 1972. Amphibian and reptiles of the Pacific states. Dover Publications, Inc., New York, New York.
- Reeve, W.L. 1952. Taxonomy and distribution of the horned lizard genus *Phrynosoma*. The Univ. Kansas Sci. Bull., 34(14):817-960.
- Schmidt, K.P. 1953. A check list of North American amphibians and reptiles. American Society of Ichthyologists and Herpetologists.
- Shaw, C.E. 1952. Notes on the eggs and young of some United States and Mexican lizards, I. Herpetologica 8(3):71-79.
- Smith, H.M. 1946. Handbook of Lizards: Lizards of the United State and Canada. Comstock Publishing Co., Ithaca, New York.
- Stebbins, R.C. 1972. California amphibians and reptiles. California Natural History Guides: 31, Univ. California Press, Berkeley, California.
- _____. 1985. Western reptiles and amphibians. Houghton Mifflin Co., Boston, Massachusetts.
- Tollestrup, K. 1981. The social behavior and displays of two species of horned lizards, *Phrynosoma platyrhinos* and *Phrynosoma coronatum*. Herpetologica 37(3):130-141.
- Van Denburgh, J. 1922. The reptiles of western North America: An account of the species known to inhabit California and Oregon, Washington, Idaho, Utah, Nevada, Arizona, British Columbia, Sonora, and Lower California. Occ. Paps. California Acad. Sci. Volume 10.
- Von Bloeker, J.C. 1942. Fauna and flora of the El Segundo sand dunes: 13. Amphibians and reptiles of the dunes. Bull. So. California Acad. Sci. 41(1):29-38.
- Ward, P.S. 1987. Distribution of the introduced Argentine ant (*Iridomyrmex humilis*) in natural habitats of the lower Sacramento Valley and its effects on the indigenous ant fauna. Hilgardia 55(2):1-16.